LESSON MAKER PRO

Sample Snapshots

Use repeated random samples to make a careful estimate.

GRADE 7 · 7.SP.A.2

CCSS.Math.Content.7.SP.A.2 "Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions..."

NAME _____ DATE _____

ESTIMATE AND CHECK SPREAD

Generate several random samples of the same size. Average their estimates and report their observed minimum and maximum to describe sample-to-sample variation. This observed spread is not a guaranteed bound on the population value.

WORKED EXAMPLE

Two random samples of 17 library books have mean checkout times of 31 days and 33 days. Estimate the population mean and give a range.

1. Add the sample means: 31 + 33 = 64.
2. Divide by the number of samples: 64 / 2 = 32.
3. The sample means run from 31 to 33.

Answer: Estimate: 32 days. Range: 31 to 33 days.

PRACTICE 5 problems

1 In a random sample of 8 students, 6 prefer longer lunch. There are 240 students. Estimate how many prefer longer lunch.

ANSWER _____

2 Four simulated samples of 10 players show 4, 5, 6, and 5 players who chose Team A. Give the best percent estimate and the range.

ANSWER _____

3 A random sample of 9 students downloads a mean of 7 songs each week. Estimate the total weekly downloads for 126 students.

ANSWER _____

4 A random sample of 16 students finds that 12 bring a water bottle. Estimate how many of 400 students bring one.

ANSWER _____

5 Three samples of 20 voters show 9, 10, and 11 votes for Candidate K. What is the best estimate for Candidate K, and about how far off might it be?

ANSWER _____

_____

APPLY IT Show your work

1 For a school election, three random surveys of 20 students show 12, 10, and 8 students supporting Maya. The school has 300 students. Predict Maya's votes and give a likely range based on the samples.

WORK SPACE

ANSWER _____

2 A gaming club surveys four random samples of 25 students about owning a controller. The samples show 18, 20, 19, and 21 owners. Out of 500 students, estimate the number of owners and give a likely range.

WORK SPACE

ANSWER _____

3 Generate samples: Your teacher provides an opaque bag of 20 identical folded slips marked A or B. The number of A slips is unknown to you. Mix thoroughly and draw 5 slips without looking; record all five letters and the A count. Return all 5 slips and mix again. Repeat for 3 samples of 5. Record each sample's A percent, average the three percents, and estimate how many of the 20 slips are A. Report the lowest and highest sample estimates and explain their variation. After the teacher reveals the actual A count, compare your estimate with it. Use extra paper for the record.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A club has 200 members. Three samples of 10 show 3, 6, and 5 members who want a tournament. Three samples of 40 show 18, 20, and 22 members who want one. Which set should guide the prediction? Give a prediction, a range, and explain why.

WORK SPACE AND ANSWER

ANSWER KEY # Sample Snapshots

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	In a random sample of 8 students, 6 prefer longer lunch. There are 240 students. Estimate how many prefer longer lunch.	**180 students**
2	Four simulated samples of 10 players show 4, 5, 6, and 5 players who chose Team A. Give the best percent estimate and the range.	**Best estimate: 50%. Range: 40% to 60%.**
3	A random sample of 9 students downloads a mean of 7 songs each week. Estimate the total weekly downloads for 126 students.	**882 downloads**
4	A random sample of 16 students finds that 12 bring a water bottle. Estimate how many of 400 students bring one.	**300 students**
5	Three samples of 20 voters show 9, 10, and 11 votes for Candidate K. What is the best estimate for Candidate K, and about how far off might it be?	**50%, about 5 percentage points**

PART 2 · APPLY IT

1. **Prediction: 150 votes. Likely range: 120 to 180 votes.** The sample percents are 60%, 50%, and 40%, so the average estimate is 50%. Apply 40% to 60% to 300 students.
2. **Estimate: 390 students. Likely range: 360 to 420 students.** The sample percents are 72%, 80%, 76%, and 84%, with an average of 78%. Apply 72% to 84% to 500 students.
3. **Results vary. For A counts 2, 3, 1: percents 40%, 60%, 20%; mean 40%; estimate 8 A slips; observed estimates 4 to 12 slips.** For each actual sample, percent = A count / 5 × 100%; population count estimate = (A count / 5) × 20. Average equal-size sample percents. The illustrative estimate 8 differs from the teacher's actual 12 by 4. Do not require students to reproduce these example results.

CHALLENGE

Use the samples of 40. Predict 100 members, with a range of 90 to 110 members. These larger samples have estimates from 45% to 55%, which vary less than the smaller samples.

Accept equivalent fractions, decimals, or percents. For ranges, accept inclusive wording such as 120 through 180. For Apply It 3, prepare 20 indistinguishable folded slips: 12 A and 8 B, hidden from students until they finish. Supply an opaque bag. Check actual 3 samples of 5, all recorded letters, replacement between samples, equal sample sizes and calculations based on the learner data. Reveal 12 afterward and assess their difference comparison. Observed ranges here and in supplied-data tasks are sample-estimate spreads, not guaranteed population bounds.